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L3	293	(715/511).CCLS.	US-PGPUB; USPAT	OR	OFF	2005/03/18 13:50
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L5	141	(715/509).CCLS.	US-PGPUB; USPAT	OR	OFF	2005/03/18 13:49
L6	1166	stor\$4 with version with table	US-PGPUB; USPAT	OR	ON	2005/03/18 13:50
L7	55	stor\$4 with (new\$4 adj version) with table	US-PGPUB; USPAT	OR	ON	2005/03/18 13:50
L8	40	stor\$4 with (old\$4 adj version) with table	US-PGPUB; USPAT	OR	ON	2005/03/18 13:51
L9	9	7 and 8	US-PGPUB; USPAT	OR	ON	2005/03/18 13:51
L18	16195	version with (table or database)	US-PGPUB; USPAT; EPO	OR	ON	2005/03/18 13:52
L19	3430	L18 and (new\$4 with version)	US-PGPUB; USPAT; EPO	OR	ON	2005/03/18 13:52
L20	107	L19 and (new\$4 with version with first with (table or database))	US-PGPUB; USPAT; EPO	OR	ON	2005/03/18 13:52
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L22	23	L20 and L21	US-PGPUB; USPAT; EPO	OR	ON	2005/03/18 13:53
L23	408	sql with column with query	US-PGPUB; USPAT	OR	ON	2005/03/18 13:53
L24	7309	obtain\$4 adj2 column	US-PGPUB; USPAT	OR	ON	2005/03/18 13:53
L25	17	L23 and L24	US-PGPUB; USPAT	OR	ON	2005/03/18 13:54
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 Terms used **store data version tables**

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# 1 [Query and view processing: On querying versions of multiversion data warehouse](#)

Tadeusz Morzy, Robert Wrembel

 November 2004 **Proceedings of the 7th ACM international workshop on Data warehousing and OLAP**

 Full text available: [pdf\(244.86 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A data warehouse (DW) is fed with data that come from external data sources that are production systems. External data sources, which are usually autonomous, often change not only their content but also their structure. The evolution of external data sources has to be reflected in a DW, that uses the sources. Traditional DW systems offer a limited support for handling dynamics in their structure and content. A promising approach to handling changes in DW structure and content is based on a mu ...

**Keywords:** data versioning, data warehouse, metadata, multiversion query, schema versioning

# 2 [Database theory, technology and applications \(DTTA\): Creation and management of versions in multiversion data warehouse](#)

Bartosz Babel, Johann Eder, Christian Koncilia, Tadeusz Morzy, Robert Wrembel

 March 2004 **Proceedings of the 2004 ACM symposium on Applied computing**

 Full text available: [pdf\(516.99 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A data warehouse (DW) provides an information for analytical processing, decision making, and data mining tools. On the one hand, the structure and content of a data warehouse reflects a real world, i.e. data stored in a DW come from real production systems. On the other hand, a DW and its tools may be used for predicting trends and simulating a virtual business scenarios. This activity is often called the what-if analysis. Traditional DW systems have static structure of their schemas and relations ...


**Keywords:** data warehouse, integrity constraints, versioning

# 3 [Industrial sessions: beyond relational tables: Coordinating backup/recovery and data consistency between database and file systems](#)

Suparna Bhattacharya, C. Mohan, Karen W. Brannon, Inderpal Narang, Hui-I Hsiao, Mahadevan Subramanian

 June 2002 **Proceedings of the 2002 ACM SIGMOD international conference on**

### Management of data

Full text available:  [pdf\(1.44 MB\)](#)


Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Managing a combined store consisting of database data and file data in a robust and consistent manner is a challenge for database systems and content management systems. In such a hybrid system, images, videos, engineering drawings, etc. are stored as files on a file server while meta-data referencing/indexing such files is created and stored in a relational database to take advantage of efficient search. In this paper we describe solutions for two potentially problematic aspects of such a data ...

**Keywords:** DB2, content management, database backup, database recovery, datalinks

#### 4 Using Applications of Data Versioning in Database Application Development

Ramkrishna Chatterjee, Gopalan Arun, Sanjay Agarwal, Ben Speckhard, Ramesh Vasudevan  
May 2004 **Proceedings of the 26th International Conference on Software Engineering**  
- Volume 00


Full text available:  [pdf\(166.57 KB\)](#)

Additional Information: [full citation](#), [abstract](#)

Database applications such as enterprise resource planning systems and customer relationship management systems are widely used software systems. Development and testing of database applications is difficult because the program execution depends on the persistent state stored in the database. In this paper we show that how versioning of the persistent data stored in the database can solve some critical problems in the development and testing of database applications can be solved by vers ...

#### 5 A linear-time scheme for version reconstruction

Lin Yu, Daniel J. Rosenkrantz  
May 1994 **ACM Transactions on Programming Languages and Systems (TOPLAS)**,  
Volume 16 Issue 3

Full text available:  [pdf\(1.47 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

An efficient scheme to store and reconstruct versions of sequential files is presented. The reconstruction scheme involves building a data structure representing a complete version, and then successively modifying this data structure by applying a sequence of specially formatted differential files to it. Each application of a differential file produces a representation of an intermediate version, with the final data structure representing the requested version. The scheme uses a ...

**Keywords:** data structures, database systems, differential files, document preparation, software systems, textual objects, version control

#### 6 Effective fine-grain synchronization for automatically parallelized programs using optimistic synchronization primitives

Martin C. Rinard  
November 1999 **ACM Transactions on Computer Systems (TOCS)**, Volume 17 Issue 4

Full text available:  [pdf\(637.69 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


This article presents our experience using optimistic synchronization to implement fine-grain atomic operations in the context of a parallelizing compiler for irregular, object-based computations. Our experience shows that the synchronization requirements of these programs differ significantly from those of traditional parallel computations, which use loop nests to access dense matrices using affine access functions. In addition to coarse-grain barrier synchronization, our irregular comput ...

**Keywords:** atomic operations commutativity analysis, optimistic synchronization, parallel computing, parallelizing compilers, synchronization

7 The BUCKY object-relational benchmark

Michael J. Carey, David J. DeWitt, Jeffrey F. Naughton, Mohammad Asgarian, Paul Brown, Johannes E. Gehrke, Dhaval N. Shah

June 1997 **ACM SIGMOD Record , Proceedings of the 1997 ACM SIGMOD international conference on Management of data**, Volume 26 Issue 2

Full text available:  [pdf\(1.48 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

According to various trade journals and corporate marketing machines, we are now on the verge of a revolution—the object-relational database revolution. Since we believe that no one should face a revolution without appropriate armaments, this paper presents BUCKY, a new benchmark for object-relational database systems. BUCKY is a query-oriented benchmark that tests many of the key features offered by object-relational systems, including row types and inheritance, references and path e ...

8 SmartFiles: an OO approach to data file interoperability

Matthew Haines, Piyush Mehrotra, John Van Rosendale

October 1995 **ACM SIGPLAN Notices , Proceedings of the tenth annual conference on Object-oriented programming systems, languages, and applications**, Volume 30 Issue 10

Full text available:  [pdf\(1.59 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Data files for scientific and engineering codes typically consist of a series of raw data values whose description is buried in the programs that interact with these files. In this situation, making even minor changes in the file structure or sharing files between programs (interoperability) can only be done after careful examination of the data files and the I/O statements of the programs interacting with this file. In short, scientific data files lack self-description, and other self-describin ...

9 P1: "Yes, but does it scale?": practical considerations for database-driven information systems

John Russell

October 2001 **Proceedings of the 19th annual international conference on Computer documentation**

Full text available:  [pdf\(231.31 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper explores the process of designing and implementing a database-driven system of online documentation, and putting it live on the web for customers to use. Using real-life examples, it discusses practical considerations for balancing performance, scalability, and reliability.

**Keywords:** Oracle, automation, categorization, database, performance, reliability, scalability, web services

10 Profiling a parallel language based on fine-grained communication

Bjoern Haake, Klaus E. Schauser, Chris Scheiman

November 1996 **Proceedings of the 1996 ACM/IEEE conference on Supercomputing (CDROM)**

Full text available:  [pdf\(198.94 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Fine tuning the performance of large parallel programs is a very difficult task. A profiling tool can provide detailed insight into the utilization and communication of the different processors, which helps identify performance bottlenecks. In this paper we present a profiler for the fine-grained parallel programming language Split-C, which provides a simple global address space memory model. As our experience shows, it is much more challenging to profile programs that make use of efficient ...

# 11 An experimental analysis of the performance of fourth generation tools on PCs

Victor M. Matos, Paul J. Jalics

November 1989 **Communications of the ACM**, Volume 32 Issue 11

Full text available:  [pdf\(1.52 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The performance of several Fourth Generation Language (4GL) tools is analyzed empirically and compared with equivalent programs written in the third generation COBOL programming language. A set of performance benchmarks consisting of thirteen separate functions is presented which encompasses the areas of simulating the operators of the relational algebra, accessing records in the database, and updating the database. This serves as a baseline for comparing the various 4GL systems.

# 12 Satellite-based information services: Cost based data dissemination in satellite networks

Bo Xu, Ouri Wolfson, Sam Chamberlain, Naphtali Rish

January 2002 **Mobile Networks and Applications**, Volume 7 Issue 1

Full text available:  [pdf\(312.11 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


We consider the problem of data dissemination in a broadcast network. In contrast to previously studied models, broadcasting is among peers, rather than client server. Such a model represents, for example, satellite communication among widely distributed nodes, sensor networks, and mobile ad hoc networks. We introduce a cost model for data dissemination in peer to peer broadcast networks. The model quantifies the tradeoff between the inconsistency of the data, and its transmission cost; the tran ...

**Keywords:** data replication, distributed databases, satellite networks

# 13 Are bitvectors optimal?

H. Buhrman, P. B. Miltersen, J. Radhakrishnan, S. Venkatesh

May 1999 **Proceedings of the thirty-second annual ACM symposium on Theory of computing**


Full text available:  [pdf\(1.01 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

# 14 Database performance in the real world: TPC-D and SAP R/3

Joachen Doppelhammer, Thomas Höppler, Alfons Kemper, Donald Kossmann

June 1997 **ACM SIGMOD Record , Proceedings of the 1997 ACM SIGMOD international conference on Management of data**, Volume 26 Issue 2

Full text available:  [pdf\(1.54 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Traditionally, database systems have been evaluated in isolation on the basis of standardized benchmarks (e.g., Wisconsin, TPC-C, TPC-D). We argue that very often such a performance analysis does not reflect the actual use of the DBMSs in the "real world." End users typically don't access a stand-alone database system; rather they use a comprehensive application system, in which the database system constitutes an integrated

component. In order to derive performance evalu ...

### 15 Experiments with an ocean circulation model on CEDAR

L. DeRose, K. Gallivan, E. Gallopoulos

August 1992 **Proceedings of the 6th international conference on Supercomputing**

Full text available:  [pdf\(1.41 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present the design of the GFDL ocean circulation model as adapted for simulations of the Mediterranean basin for the Cedar multicluster architecture. The model simulates the basic aspects of large-scale, baroclinic ocean circulation, including treatment of irregular bottom topography. The data and computational mapping strategies and their effect on the design are discussed. The code was parametrized to offer several choices for data partitionings of the computational domain, for placement ...

### 16 The logical disk: a new approach to improving file systems

Wiebren de Jonge, M. Frans Kaashoek, Wilson C. Hsieh

December 1993 **ACM SIGOPS Operating Systems Review , Proceedings of the fourteenth ACM symposium on Operating systems principles**, Volume 27 Issue 5

Full text available:  [pdf\(1.55 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The Logical Disk (LD) defines a new interface to disk storage that separates file management and disk management by using logical block numbers and block lists. The LD interface is designed to support multiple file systems and to allow multiple implementations, both of which are important given the increasing use of kernels that support multiple operating system personalities. A log-structured implementation of LD (LLD) demonstrates that LD can be implemented efficiently. LLD adds about 5% to 10% ...

**Keywords:** MINIX, UNIX, disk storage management, file system organization, file system performance, high write performance, log-structured file system, logical disk

### 17 Physical design: Handling big dimensions in distributed data warehouses using the DWS technique

Marco Costa, Henrique Madeira

November 2004 **Proceedings of the 7th ACM international workshop on Data warehousing and OLAP**

Full text available:  [pdf\(288.33 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The DWS (Data Warehouse Striping) technique allows the distribution of large data warehouses through a cluster of computers. The data partitioning approach partitions the facts tables through all nodes and replicates the dimension tables. The replication of the dimension tables creates a limitation to the applicability of the DWS technique to data warehouses with big dimensions. This paper proposes a strategy to handle large dimensions in a distributed DWS system and evaluates the proposed strategy ...

**Keywords:** data warehousing, distributed query execution

### 18 Compiler-directed run-time monitoring of program data access

Chen Ding, Yutao Zhong

June 2002 **ACM SIGPLAN Notices , Proceedings of the workshop on Memory system performance**, Volume 38 Issue 2 supplement

Full text available:  [pdf\(1.40 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)


Accurate run-time analysis has been expensive for complex programs, in part because most

methods perform on all a data. Some applications require only partial reorganization. An example of this is off-loading infrequently used data from a mobile device. Complete monitoring is not necessary because not all accesses can reach the displaced data. To support partial monitoring, this paper presents a framework that includes a source-to-source C compiler and a run-time monitor. The compiler inserts ru ...

### 19 Making data structures confluent persistent

Amos Fiat, Haim Kaplan

January 2001 **Proceedings of the twelfth annual ACM-SIAM symposium on Discrete algorithms**


Full text available:  [pdf\(924.65 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We address a longstanding open problem of [8, 7], and present a general transformation that takes any data structure and transforms it to a confluent persistent data structure. We model this general problem using the concepts of a version DAG (Directed Acyclic Graph) and an instantiation of a version DAG. We introduce the concept of the effective depth of a vertex in the version DAG and use it to derive information theoretic lower bounds on the space expansion of any such transformation for ...

### 20 Continuous queries over append-only databases

Douglas Terry, David Goldberg, David Nichols, Brian Oki

June 1992 **ACM SIGMOD Record , Proceedings of the 1992 ACM SIGMOD international conference on Management of data**, Volume 21 Issue 2

Full text available:  [pdf\(1.19 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In a database to which data is continually added, users may wish to issue a permanent query and be notified whenever data matches the query. If such continuous queries examine only single records, this can be implemented by examining each record as it arrives. This is very efficient because only the incoming record needs to be scanned. This simple approach does not work for queries involving joins or time. The Tapestry system allows users to issue such queries over a databa ...

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